NPOESS Preparatory Project (NPP)
Science Data Segment (SDS)
Ocean Product Evaluation and Analysis Tool Element (PEATE) Peer Review

November 30, 2005

Ocean PEATE Team

Agenda

- Introduction
- Design Overview
- Ocean PEATE Implementation
- Schedule and Resources
- Issues and Conclusion

Primary Tasks of the Ocean PEATE

- Acquire VIIRS RDRs, SDRs, and Ocean EDRs from the SD3E and ADS/CLASS
- Assess the quality of the NPP Ocean EDRs for accomplishing NASA's climate research requirements
- Provide suggested algorithm improvements to the IDPS via the Project Science Working Group (PSWG)
- Process selected data subsets in support of Evaluation and Validation activities

Requirements Overview

Requirement Number	Requirement Description
3.4	**PRODUCT EVALUATION AND ANALYSIS TOOL ELEMENTS (PEATEs)**
3.4.1	**PEATEs Ingest Data**
3.4.1.1	The PEATEs shall have the capability of ingesting xDRs from the SD3E.
3.4.1.2	The PEATEs shall have the capability of ingesting IPs from the SD3E.
3.4.1.3	The PEATEs shall have the capability of ingesting official ancillary data from the SD3E.
3.4.1.4	The PEATEs shall have the capability of ingesting and storing calibration products from the SD3E.
3.4.1.5	The PEATEs shall have the capability of requesting: a listing of current products in SD3E, a listing of products for SD3E to re-acquire, and a listing of products for SD3E to retransmit
3.4.1.6	The PEATEs shall provide the capability of submitting product subscriptions to the ADS as a request for data delivery.
3.4.1.7	The PEATEs shall be capable of submitting ad-hoc requests to the ADS.
3.4.1.8	The PEATEs shall have the capability of ingesting xDRs from the ADS.

Requirements Overview

Requirement Number	Requirement Description
3.4.1.9	The PEATEs shall have the capability of ingesting official ancillary data from the ADS.
3.4.1.10	The PEATEs shall have the capability of ingesting and storing calibration products from ADS.
3.4.1.11	The PEATEs shall have the capability of ingesting IP from the ADS.
3.4.1.12	The PEATEs shall have the capability of ingesting status information about queries made to the ADS.
3.4.1.13	The PEATEs shall have the capability of ingesting additional ancillary data from other sources (e.g., NOAA/NESDIS, NASA, USGS, JPL, NOAA Space Environment Center, USNAVO) as deemed appropriate by each PEATE.
3.4.1.14	The PEATEs shall have the capability of ingesting pre-launch algorithms, calibration, test data files, and instrument parameters from the NEXT system.
3.4.1.15	The PEATEs shall have the capability of ingesting engineering reports from the C3S

Requirements Overview

Requirement Number	Requirement Description
3.4.2	**Store/Catalog Data**
3.4.2.1	The PEATEs shall have the capability of storing and cataloging all data needed for EDR evaluation.
3.4.3	**Manage Software Configuration**
3.4.3.1	The PEATEs shall have the capability of performing source code configuration control for all software and documentation developed or enhanced.

Requirements Overview

Requirement Number	Requirement Description
3.4.4	**Process Science Data**
3.4.4.1	The PEATEs shall have the capability of ingesting the operational algorithms for processing from the SD3E.
3.4.4.2	The PEATEs shall have the capability of receiving management directions (e.g., priority changes) from the PSOE.
3.4.4.3	The PEATEs shall have the capability of receiving instrument service reports from the PSOE.
3.4.4.4	The PEATEs shall have the capability of receiving Cal LUTs from the NICSE.
3.4.4.5	The PEATEs shall have the capability of receiving algorithm status from the I&TSE.
3.4.4.6	The PEATEs shall have the capability of supporting the Science Team in pre-launch assessment of RDR, SDR, EDR, and Intermediate Products.
3.4.4.7	The PEATE shall support the Science Team in assessment of xDR and IP science algorithm functionality and implementation.
3.4.4.8	The PEATEs shall have the capability of supporting the Science Team in obtaining, examining, and running EDR operational algorithm from the IDPS.

Requirements Overview

Requirement Number	Requirement Description
3.4.4.9	The PEATEs shall have the capability of supporting the Science Team in testing and characterizing candidate improvements/enhancements made to SDR and EDR science or operational algorithm software.
3.4.4.10	The PEATEs shall have the capability of supporting the Science Team in developing comparison tools (e.g., IDL programming, FORTRAN and C programming, etc.).
3.4.4.11	The PEATEs shall have the capability of supporting the Science Team in comparing products against data from other satellite missions and ground truth measurement campaigns.
3.4.4.12	The PEATE shall have the capability of supporting the Science Team in running comparisons between standard and alternate products and in analyzing comparison results.
3.4.4.13	The PEATEs shall have the capability of supporting the Science Team in analyzing comparison results and developing candidate science algorithm improvements and enhancements.
3.4.4.14	The PEATEs shall have the capability of supporting processing of RDRs into SDRs using software used by IDPS with alternate LUTs provided by the Science Team.

Requirements Overview

Requirement Number	Requirement Description
3.4.4.15	The PEATEs shall have the capability of supporting processing of SDRs into EDRs using software used by IDPS with alternate LUTs generated by the Science Team.
3.4.4.16	The PEATEs shall have the capability of supporting the Science Team in their development and generation of data for testing candidate science algorithms.
3.4.4.17	The PEATE shall have the capability of supporting the Science Team in developing candidate SDR (L1B) science algorithm improvements/enhancements.
3.4.4.18	The PEATE shall have the capability of supporting the Science Team in developing candidate EDR (L2 and L3) science algorithm improvements/ enhancements.
3.4.4.19	The PEATE shall have the capability of supporting the Science Team in testing and evaluating candidate improvements/enhancements made to SDR and EDR operational algorithm.
3.4.4.20	The PEATEs shall have the capability of supporting the Science Team in documenting software that was developed in the course of the mission.
3.4.4.21	The PEATEs shall have the capability of providing a status report to the PSOE.

Requirements Overview

Requirement Number	Requirement Description
3.4.4.22	The PEATEs shall have the capability of requesting instrument service reports from the PSOE.
3.4.4.23	The PEATEs shall have the capability of processing calibration quality control requests for calibration validation from NICSE.
3.4.4.24	The PEATEs shall have the capability of providing NICSE with the results of calibration evaluation.

Requirements Overview

Requirement Number	Requirement Description
3.4.5	**PEATEs Export Data**
3.4.5.1	The PEATEs shall have the capability of exporting all science data collected to the Science Team
3.4.5.2	The PEATEs shall have the capability of permitting the Science Team to place standing orders for xDRs and ancillary data stored in the PEATEs.
3.4.5.3	The PEATEs shall have the capability of pushing science data to the Science Team members.
3.4.5.4	The PEATEs shall have the capability of delivering data to Science Team members in response to ad-hoc browse and order sessions.
3.4.5.5	The PEATEs shall have the capability of compressing data that they deliver to users.

Requirements Overview

Requirement Number	Requirement Description
3.4.8	**Ocean PEATE**
3.4.8.1	The NPP Ocean PEATE shall assess short-term and long-term quality, through independent means, of the NPP Ocean Color and Sea Surface Temperature EDR for climate research.
3.4.8.2	The NPP Ocean PEATE shall provide to the NPP Science Team the capabilities necessary to validate NPP Ocean Product as listed in the EDR allocations Table in Appendix D, or Enhanced EDRs developed by the Science Team in cases where the EDR is insufficient for climate research.

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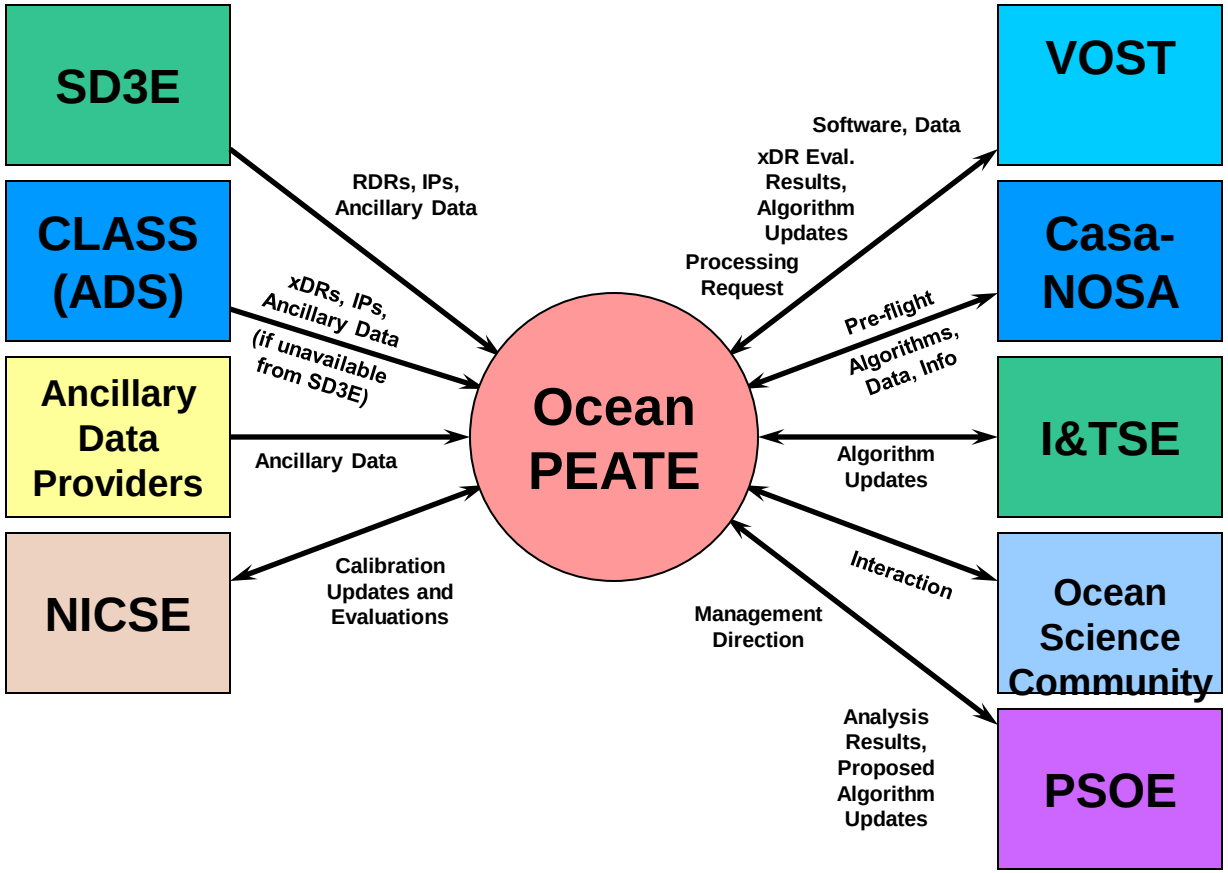
Ocean PEATE External Interfaces

- SDS Science Data Distribution and Depository Element (SD3E)
  - Provides NRT access to raw data
  - Primary source of RDRs
  - Provides selected SDRs and EDRs
- SDS Integration and Test System Element (I&TSE)
  - Test updates to operational code prior to delivery to IDPS
- Archive Distribution Segment (ADS)
  - Primary source for archived data
    - xDRs, IPs, Ancillary Data, Operational Algorithm/Source Code and Calibration Products
- Ancillary Data Providers (ADP)
  - Provides alternate ancillary data sets (e.g., ozone, meteorological data sets)
- CasaNOSA
  - Serves as the NPP pre-flight repository of Government held data for distribution to Government user teams
  - Place to acquire pre-launch NPP algorithms and supported data files
- NASA VIIRS Ocean Science Team (VOST)
  - Coordinate activities with PEATEs and PSOE on xDR and recommended algorithm improvements. Supports Independent Calibration Validation Activities
- NPP Instrument Calibration Support Element (NICSE)
  - Provides alternative calibration LUTs and recommended improvements to calibration algorithms
  - PEATE provides results of LUT and algorithm tests
- Project Science Office Element (PSOE)
  - Provides management direction
  - Accepts algorithm update recommendations
- Ocean Science Community
  - Relies on Ocean PEATE to provide evaluation products and results

Ocean PEATE Interface Diagram



ODPS Design

This section provides an overview of the history, architecture, design philosophy, configuration management, features, components, and lessons learned for the current Ocean Color Data Acquisition, Processing, Quality-Control, Archive, and Distribution system.

This system has been successfully supporting operational, satellite-based remote-sensing missions since 1996, and its capabilities continue to evolve and expand to meet the demands and challenges of future missions.

Design Overview

- Fully automated, distributed data system for acquiring, processing, archiving, and distributing scientific data
- Highly scalable
- Easily adaptable to support multiple concurrent missions
- Graphical user interfaces for controlling and monitoring system functions and activity
- Non-platform specific

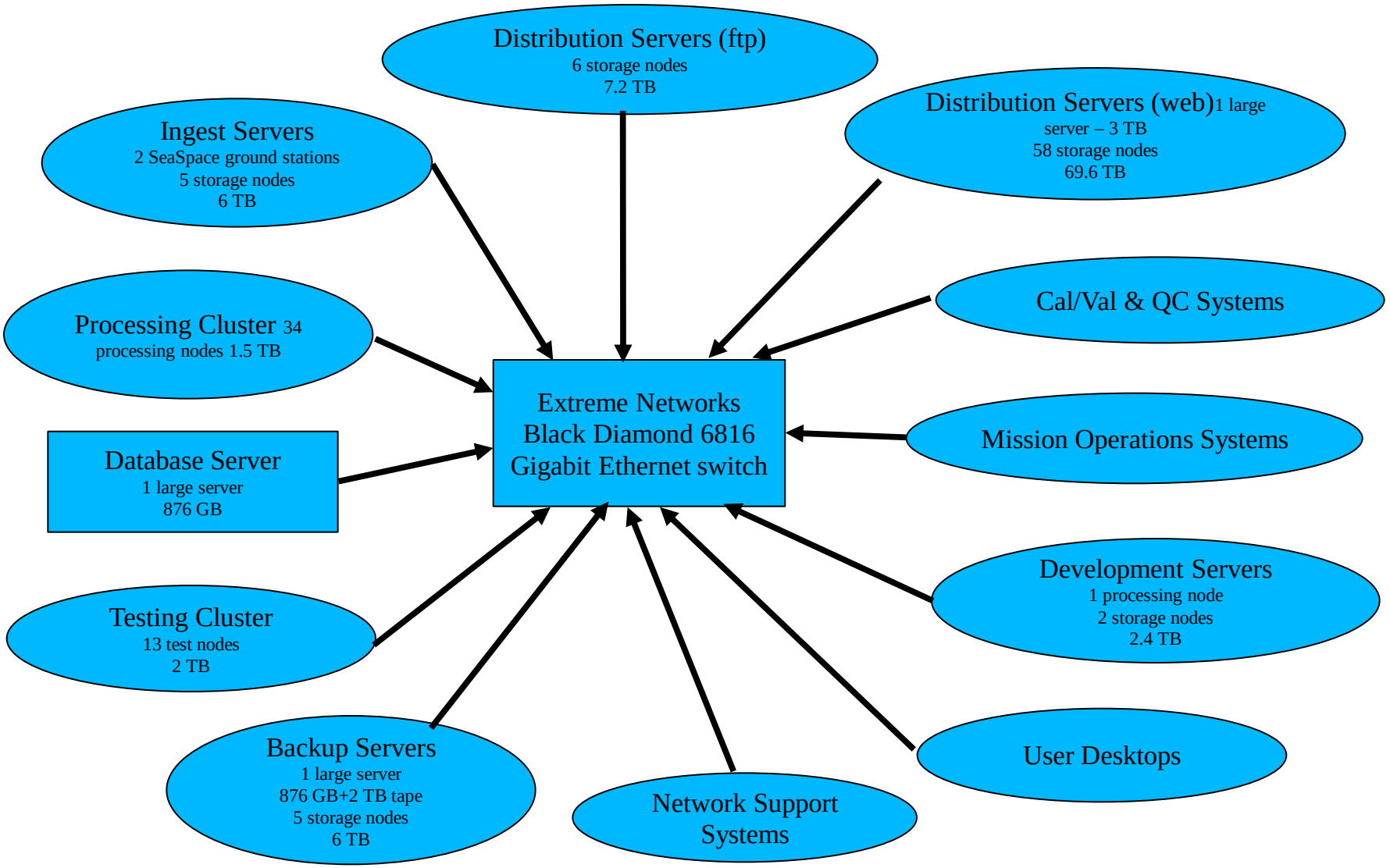
Design Philosophy

- Building-Block approach
  - Programs usually small and do one thing well
  - Programs are less complex and subsequently easy to maintain
  - Promotes reuse
  - Programs loosely coupled so testing and production can be done in the same environment
- Adopt basic standards
  - ANSI, POSIX, C9x
  - Use existing technology when possible
  - Exit statuses indicate successful or failure conditions

Architecture: Hardware

- Processing Servers
  - Intel-based dual Xeon / AMD-based dual Opteron
  - 8 GB RAM
  - 5 72-GB SCSI drives
- Storage Servers
  - Intel-based P4 / AMD-based single Opteron
  - 2 GB RAM
  - 1.2 TB IDE RAID 5 (3ware) / 5.1 TB SATA RAID 6 (Areca)
  - 2 hot spare drives
- Database Server
  - Sun V880
  - 8 GB RAM
  - 9 70-GB SCSI HDD

ODPS Data Processing System
Current Components



Architecture: Software

- System Software
  - C
  - Perl
  - Shell (sh/csh)
  - SQL
- Additional Software Required
  - Sybase
    - Adaptive Server Enterprise (12.5.3)
    - Open-Client CT-Library
  - Perl DBI Module
  - X/Motif (Open Motif 2.2)
  - GMT 3.4.1
  - ImageMagick 5.5.6
  - Netpbm 9.24

Software Configuration Management

- Science software maintained separately from system software
- Separate development, testing, and operational environments allow new features to be added with no impact on operational activities
- All environments are password protected to restrict access to authorized developers and operators
- Science software is delivered as precompiled binary executables to eliminate the possibility of changes being introduced by a different build environment

Software Configuration Management

- Science software versions are stored in the product-catalog database tables to provide a trace back to the specific build that created a product

- Major changes to scientific and system software configuration are recorded in a Mission Events and Major Changes log, which can be publicly accessed via the Ocean Color web site

- System and science code maintained under source-code version-control system, currently ***Subversion*** (subversion.tigris.org) in use

System Features

- Graphical user interfaces with color-coded displays allow system status to be determined at a glance and provide a mechanism for controlling system functions
- Distributed architecture provides high level of scalability
- Automated active and passive data-acquisition mechanisms
- Dynamic allocation of user-defined processing resources
- Easily configurable report manager provides additional operator “eyes”
- Token-based network load balancing

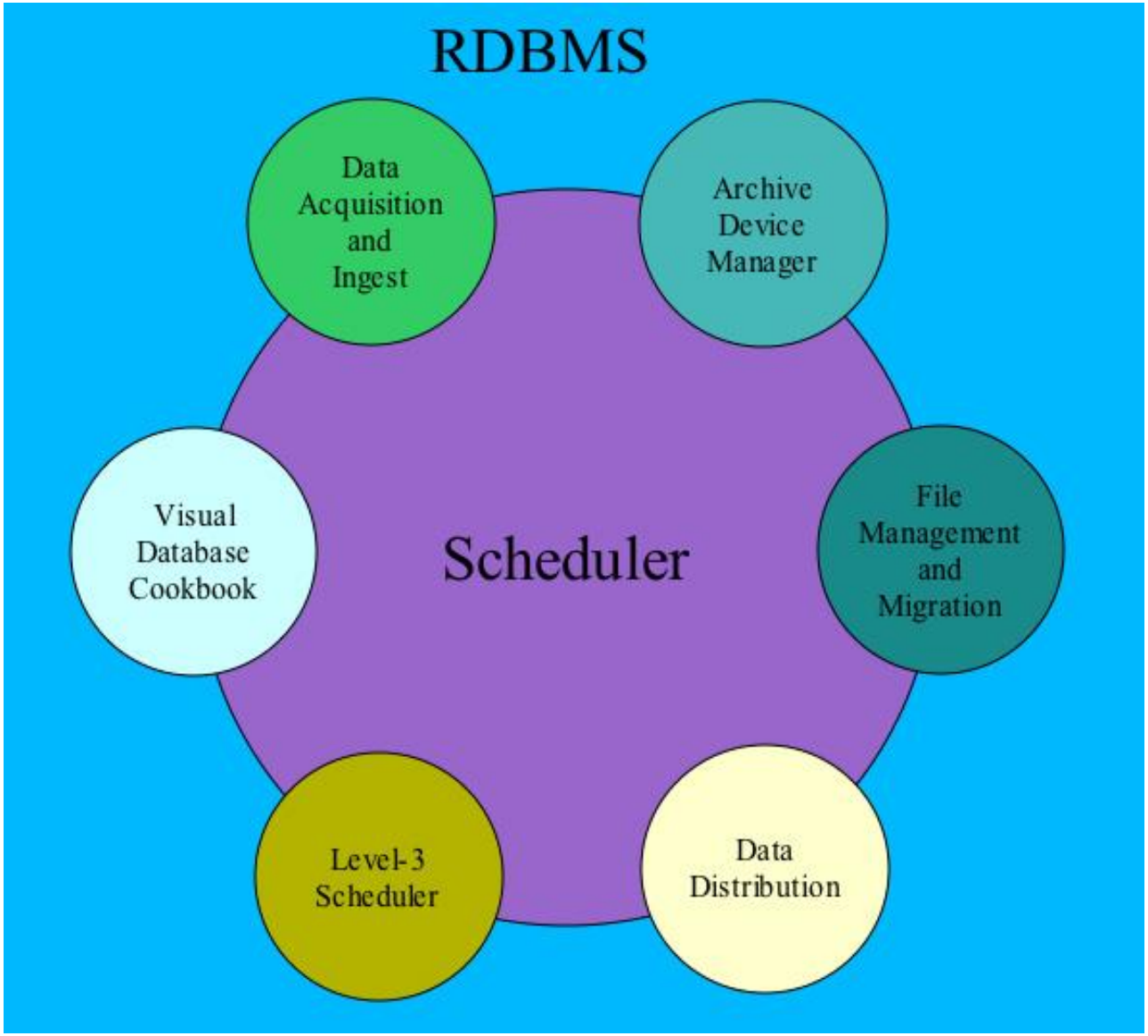
System Features (cont.)

- Innovative disk-resource management for supporting logical archive pools
- Host and disk monitors poll system resources and toggle their availability for use within the system
- Prioritized processing capability
- Host-based processing constraints
- Data-specific pre-processing rule enforcement
- Event- and time-based file migration and management
- Back end for web-based data ordering and distribution

System Adaptability

- Generic core components are non-data specific
- Scalable architecture
- Non-platform dependent, currently SGI IRIX and Linux (ix86) supported
- Shell wrappers allow new processing algorithms to be quickly adapted into production
- Support for ADEOS OCTS mission in less than two weeks and ported a fully functional system to NOAA in one week

Components and Subsystems



Components and Subsystems: RDBMS

- Primary element that manages all system activity
- Generic core databases support system infrastructure and non-mission-specific functions
- Mission databases catalogue products and house mission-specific data and procedures
- High level of reuse possible for similar missions
  e.g. MODIS Aqua/Terra, SeaWiFS, and OCTS are all ocean-color missions and have similar product suites and requirements

Components and Subsystems

- Relational Database Management System (RDBMS) supports all of the system components (subsystems)
- Scheduler is the primary controlling module within the system, supporting both time- and event-based tasks
- Other subsystems are independent modules, yet rely on the Scheduler for some their functions
  - Scheduler
  - Visual Database Cookbook (VDC)
  - Archive Device Manager (ADM)
  - Data acquisition and ingest
  - Level-3 Scheduler
  - File migration and management
  - Data distribution

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Ocean PEATE-Specific Tasks

- Acquire and ingest xDRs from the SD3E:
  - VIIRS RDRs
  - VIIRS CaDRs (calibration RDRS)
  - VIIRS SDRs
  - OCC EDRs
  - SST EDRs
  - VIIRS IPs
- Acquire and ingest xDRs from ADS/CLASS
  (same as above except maybe not RDRs)
- Acquire and ingest NPP ancillary data sets
- Catalog and manage NPP data sets (all of the above)

Ocean PEATE-Specific Tasks (cont.)

- Support evaluation processing of VIIRS data using IDPS operational code: SDRs, OCC EDRs, SST EDRs
- Support VIIRS calibration analysis using CaDRs (solar and lunar calibrations)
- Perform matchups of VIIRS data with SeaBASS data
- Support cross-comparison of VIIRS ocean data with concurrent sensor data sets
- Support cross-comparison of VIIRS ocean data with climatological data sets
- Support internal consistency evaluation of VIIRS ocean data

  - Interannual repeatability in deep and clear water

Data Acquisition and Ingest

- Insert DB records for new data-source servers and data types
- Compose data-specific post-ingest scripts
- Configure ingest daemons if that method is going to be used for any of the new data types
- Define archive-device pools for product storage

Data Cataloging

- Insert record into the core tables (catalog DB) that describe the mission and products
- Create mission specific database and objects, reusing objects from existing mission databases where applicable
- Compose a program to provide geographical L1 meta-data information including granule start and stop times, day-night flag, and geographic coordinates, e.g.: MSl1info
- Compose functions for DB-metaload program, so meta-data files can be read and product tables can be populated
- Configure file migration and management actions for new mission data

Data Processing Streams

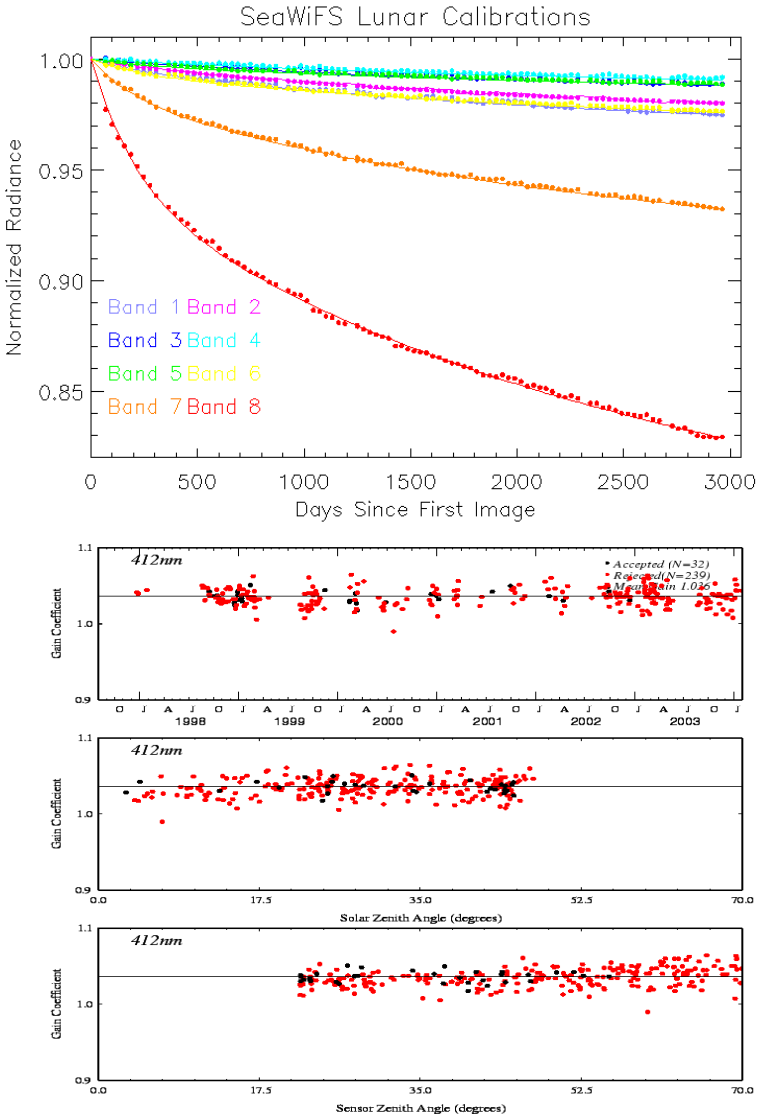
- Define a recipe for each distinct serial processing stream
- Insert records for each recipe and each recipe step
- Compose a job template for each recipe
- Compose a ancillary-selection procedure for each recipe that requires ancillary data
- Compose wrapper scripts for each science program associated with the new mission's data
- Insert record in recipe-constraints table for each processing host allowed to run a recipe
- Compose AP-load procedure for each base data type that can be processed with a recipe
- Update the reproc program to support each base data type that has an AP-load procedure
- Configure L3-Scheduler for desired composite processing

Data Distribution

- Update Subscription CGI to support new mission data
- Compose match-subscription procedure
- If data extraction and mapping is to be supported:
  - Compose extraction and mapping programs
  - Compose match-XM-requests procedure
  - Modify XM CGI to support new mission products
- Compose browser capabilities for new mission products
- Provide FTP access to new mission products

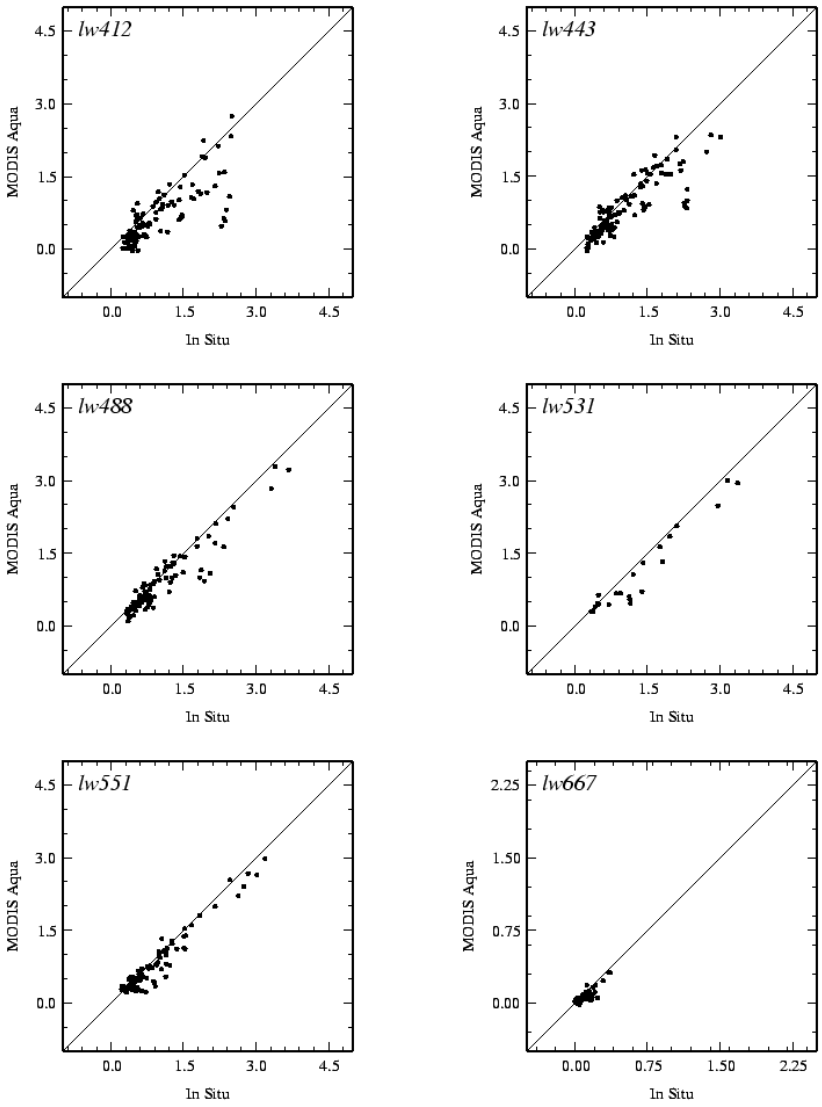
Calibration Analyses

- NICSE has primary responsibility for radiometic calibration of VIIRS
- VOST will provide support and supplemental analyses to achieve radiometric accuracy needed for Ocean products
- Temporal radiometric stability has been achieved for SeaWiFS over the 8 year mission using lunar calibrations
- Vicarious calibration using surface measurements gives constant gain correction

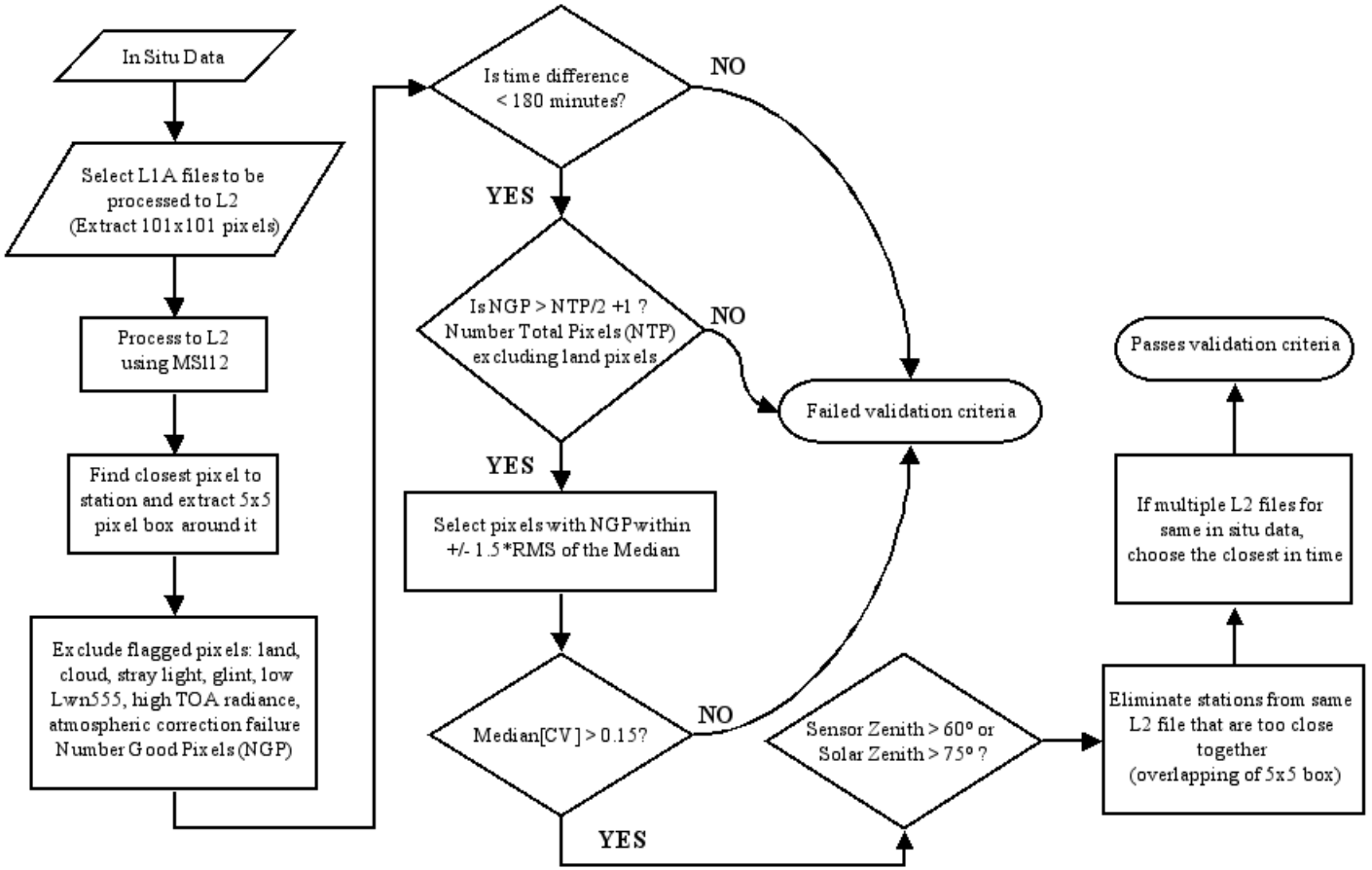


Matchup Analysis

- Ocean data granules in ODPS catalog are automatically matched with in situ data
- SeaWiFS Bio-optical Archive and Storage System (SeaBASS) stores and manages in situ holdings from field programs and supported investigators.
- Ocean staff acquire, QC and analyze new data samples
- Over 300,000 in situ samples stored

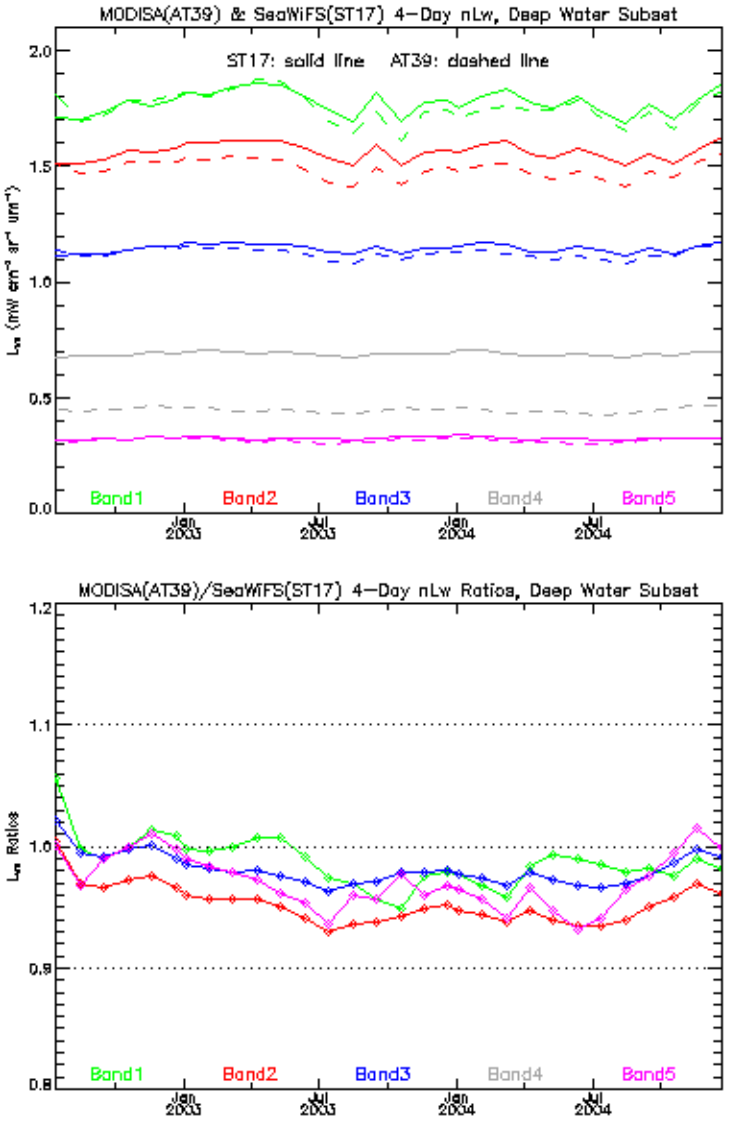


Matchup Process Flow Chart

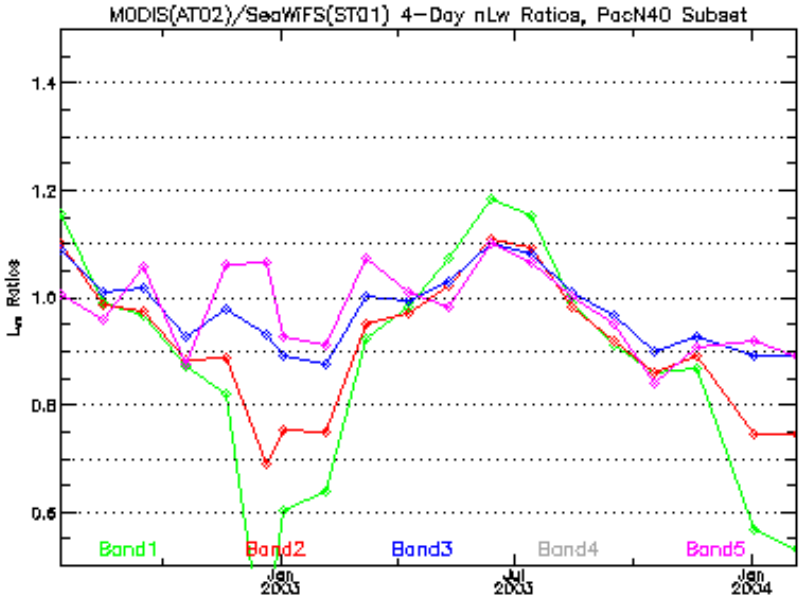


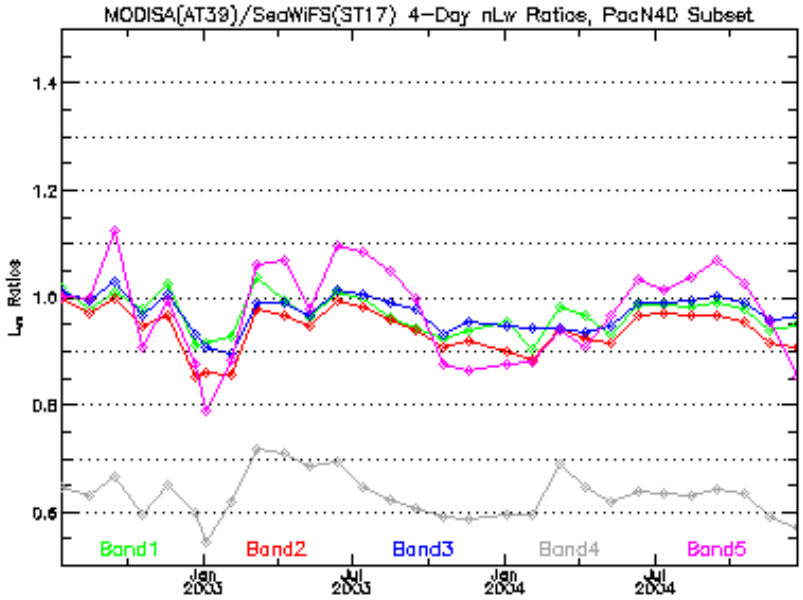
Sensor Cross-Comparisons

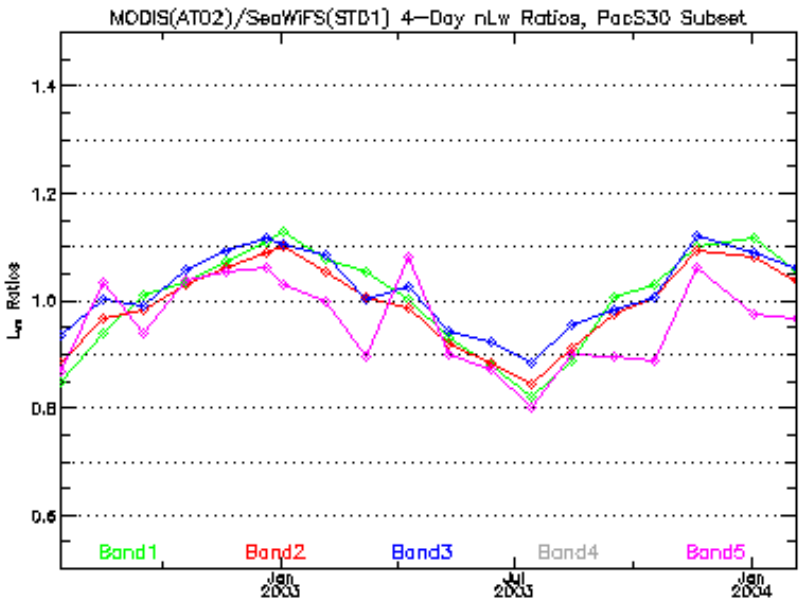
- Level-3 parameters (e.g., nLw) compared for common spectral bands
- Common bins extracted and compared over the period of overlap between the sensors
- Comparisons are performed globally (deep water, clear water, coastal), zonally and for specified regions.

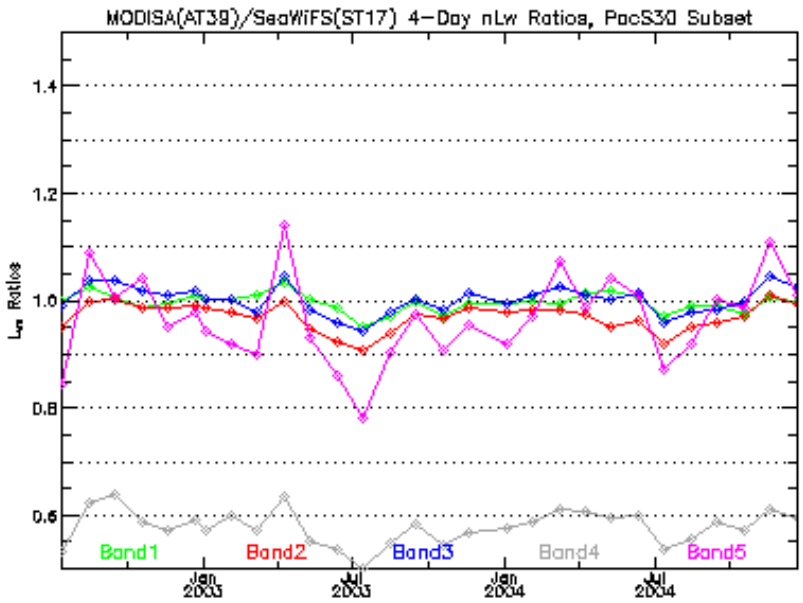


Improvement in MODIS-SeaWiFS Comparisons



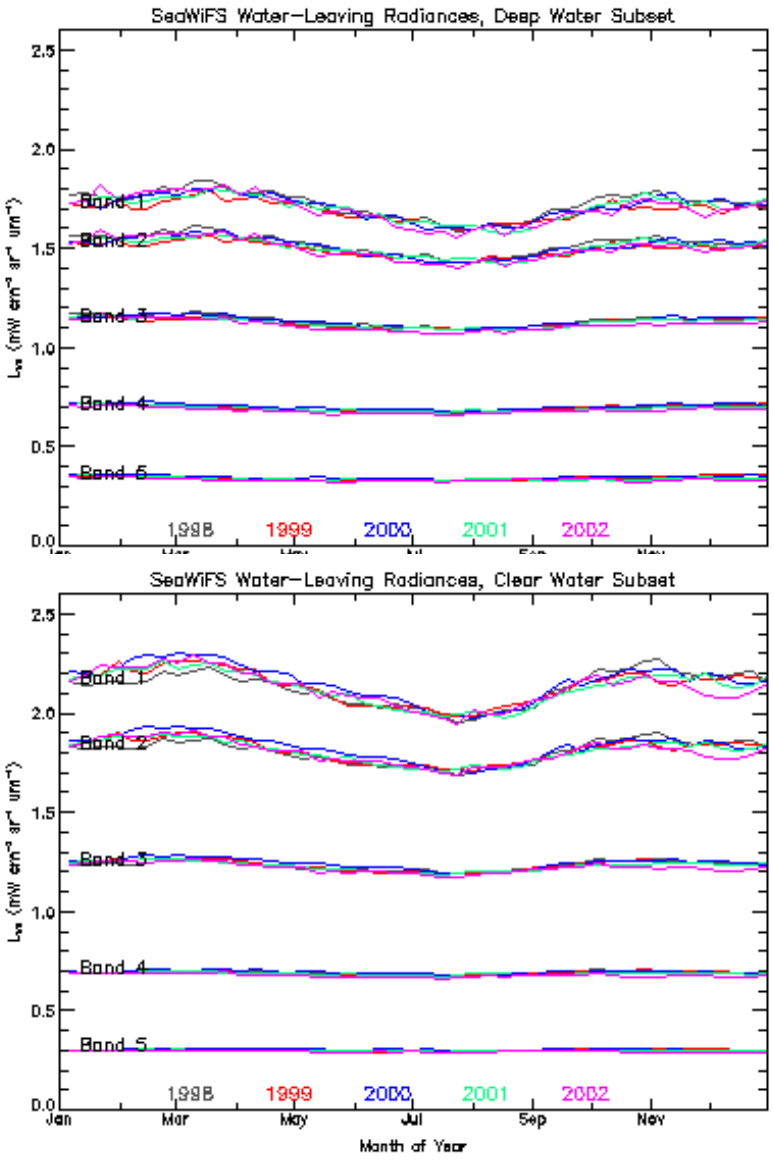






Internal Consistency Analysis

- Global averages from successive years are overplotted to determine interannual repeatability.



Level-3 Product Generation

- Sensor cross-comparisons and interannual comparisons require Level-3 binned (equal-area) products.
- The Ocean PEATE will implement software to process VIIRS EDRs to Level 3 binned products in current ODPS (SeaWiFS-like) format.
  - Use current binning code with new input functions to read EDRs
- This will automatically provide the additional capabilities to produce multi-temporal composites, standard mapped image (SMI) products and Level-3 browse files.

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Schedule

Initial Capability (L-18 months)

- All interfaces fully implemented and tested
- Initial (build 1.3?) versions of operational code ported and running in ODPS
- L-3 product code developed and tested
- Data storage capacity for ? months
- Initial test products generated for review by VIIRS Ocean Science Team

Full Mission Capability (L-12 months)

- Routine exercise of interfaces to acquire proxy, surrogate (Aqua?) and/or simulated data
- Prelaunch (build 1.4?) versions of operational code running in ODPS
- Browse and distribution capability developed and tested
- Test products routinely generated based on simulated data and posted for access by VIIRS Ocean Science Team
- Data storage for ? years

Data Storage Estimate

Data Type	Daily	1 Year	5 Years
RDR	150 GB	53.5 TB	267.5 TB
SDR (M-band)	194 GB	7 TB (*)	35 TB (*)
OCC EDR	38 GB	1.4 TB (*)	7 TB (*)
SST EDR	17 GB	0.6 TB (*)	3 TB (*)
Inter. Products	70 GB	N/A	N/A
Ancillary Data	0.1 GB	.04 TB	.2 TB
Total	469 GB	62.5 TB	312.7 TB

Assumption: (*) Long-term storage is sized for 100% of RDRs and 10% of SDRs and EDRs; packaged without geolocation.

Ocean PEATE Testing

- Initial Capability Testing
  - Data acquisition and ingest testing will depend upon availability of external interfaces and convergence of data product formats.
  - Product generation testing generation will depend upon completion of IDPS-independent operational software that is compatible with external data product formats, and availability of test data sets to reasonably exercise algorithms and software logic.
- Full Mission Capability Testing
  - Objective is to continuously exercise interfaces, systems and software in NRT mode using realistic simulated data.
  - Support for functional tests, instrument data flows and mission simulations as defined by Project test schedule.

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Issues

- Operational code versions to run in the PEATEs
  - Porting efforts by IPO CalVal, Direct Readout Lab, PEATEs
  - Consistency of ported versions – data formats, O/S, compilers, runtime interfaces
- ADS/CLASS
  - Archived versions of xDRs (e.g., aggregations)
  - Bandwidth for bulk data transfers
- Reliability and stability of external data product formats and documentation
- Availability of useful test data sets
  - Radiometric and geometric fidelity for testing algorithms
  - Instrument format fidelity for RDRs (compression, housekeeping, calibration)
  - Ongoing simulations to provide reasonable level of operational testing
- Schedule and plans for interface and mission tests
  - Objectives vs. test data sets
  - Instrument test data flows – before and after S/C integration, duration, etc.
  - Current test schedule w.r.t. launch date
- Processes and mechanisms for getting algorithm changes approved and into the IDPS operational code.

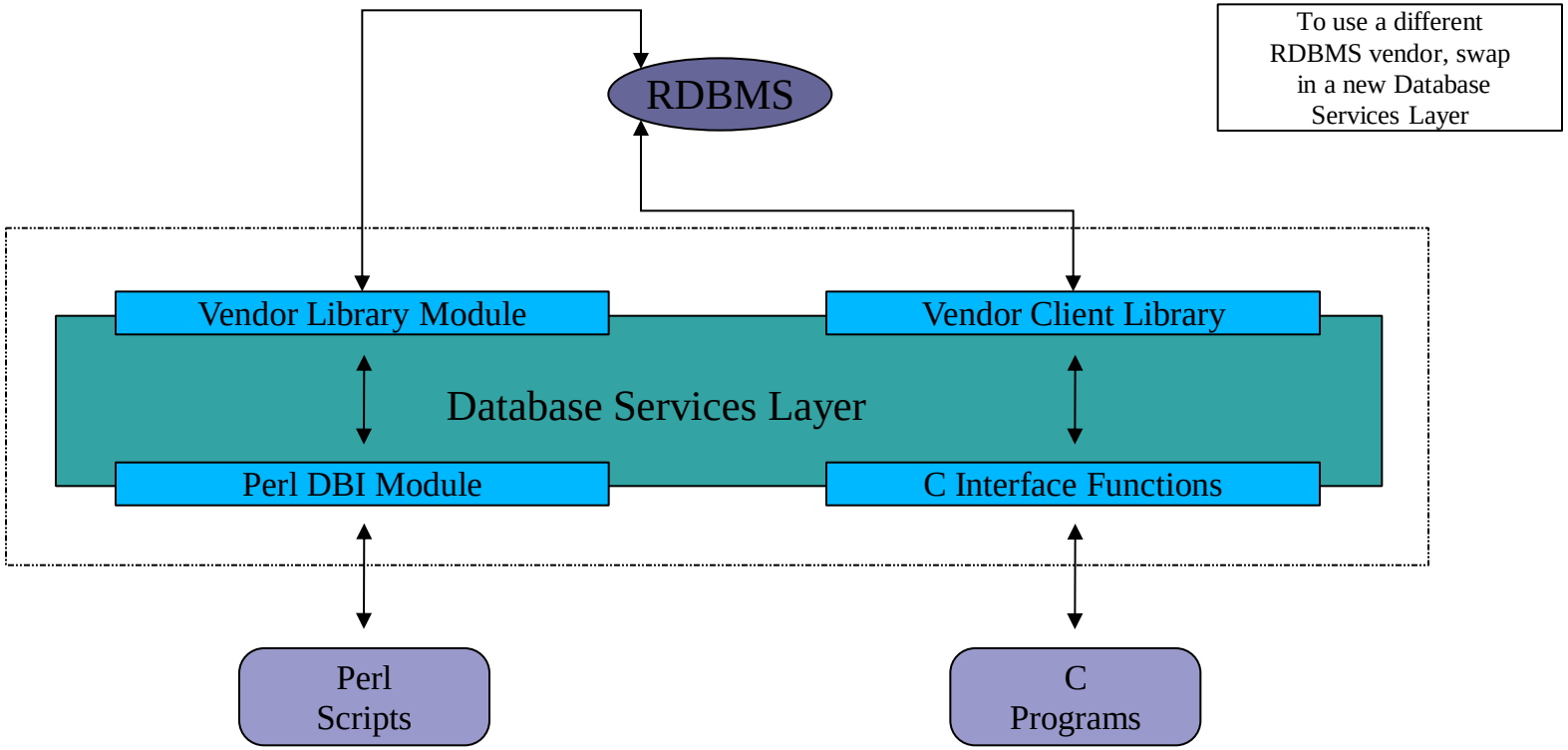
Conclusion

- Ocean PEATE requirements will be supported using the proven capabilities of the ODPS, which will support EDR evaluation strategies successfully employed on current missions.
- ODPS has well-established processes for adding the data acquisition, management, processing and distribution tasks needed by the Ocean PEATE.
- Additional capacity (roughly equivalent to combined Terra and Aqua MODIS) will be readily supported by technology refresh by readiness date of L-1 year.
- Additional development effort (Level-3 products) leverages existing software.
- Evaluation methodologies and tools are already established for data sets cataloged within the ODPS.
- Main issues pertain to IDPS software porting effort and system-level testing.

Backup Slides

Components and Subsystems: RDBMS

Goal: Isolate RDBMS from system software



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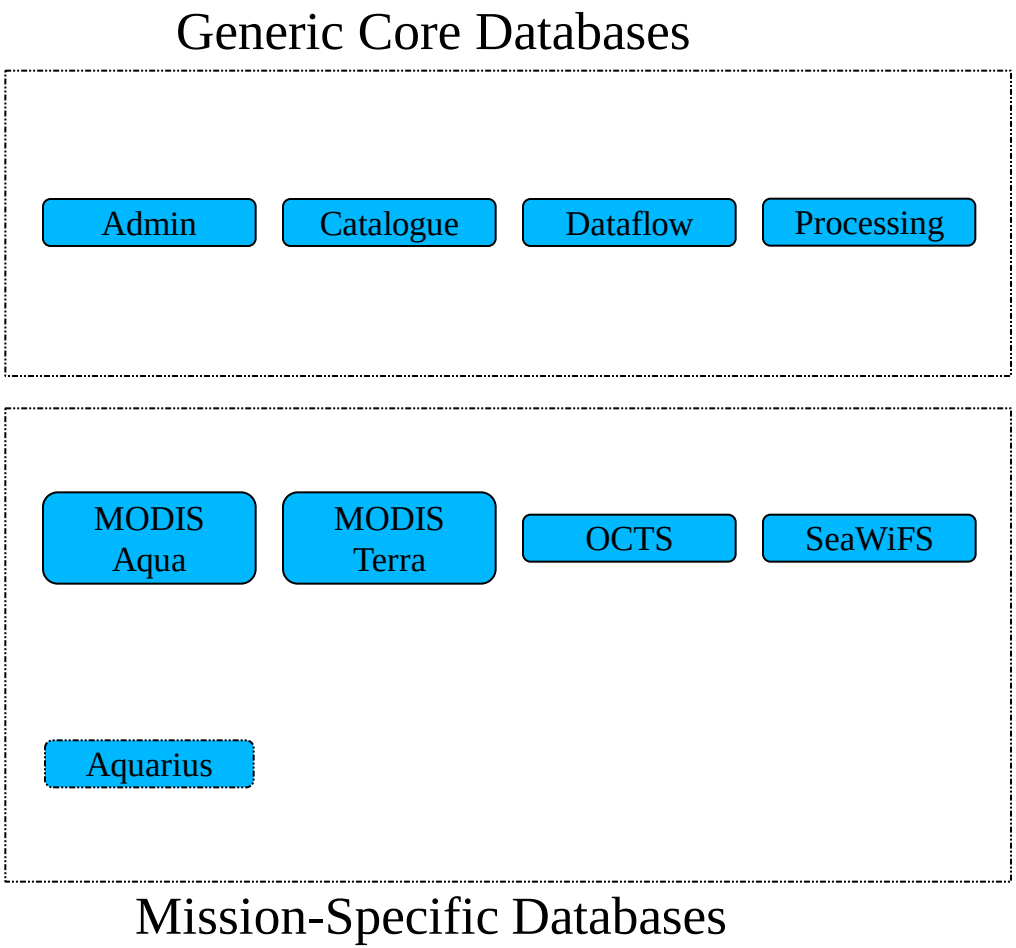
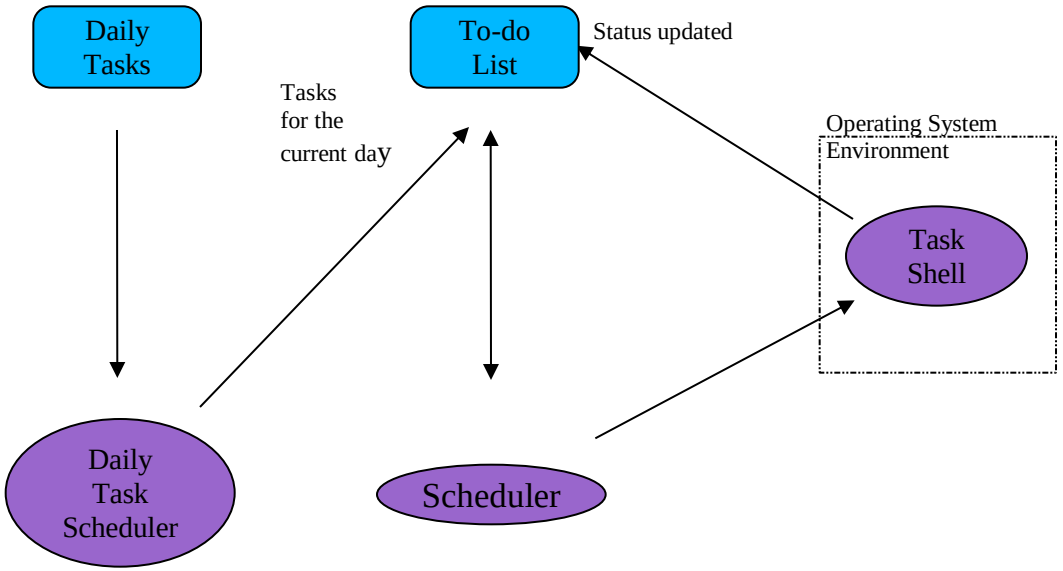


Subsystems: Scheduler

- C program with supporting database procedures
- Runs in a daemon-like state
- Primary system element responsible for coordinating most of the system activity
- Monitors task records in a to-do list database table
- Runs tasks according to defined task attributes
- Standard job-shell interface allows new programs to be quickly adapted for Scheduler control

Subsystems: Scheduler



Subsystems: VDC

- Highly scalable, distributed infrastructure for concurrent processing of serial streams (e.g. L0 -> L1A -> L1B -> L2)
- Suite of C programs with supporting database procedures
- Uses recipes to encapsulate data-specific processing schemes, parameters, and pre-processing rules
- Virtual Processing Units (VPUs) serve as distinct distributed processing resources
- VPUs dynamically allocated based on available time and current OS load
- Comprehensive, user-defined processing priorities

VDC: Ancillary Data Stager

- Runs in a daemon-like state
- Monitors entries in the processing queue and runs the ancillary-select procedure for each entry's recipe
- Updates queue-entry status when ancillary data are available
- Governed by currently configured processing priorities

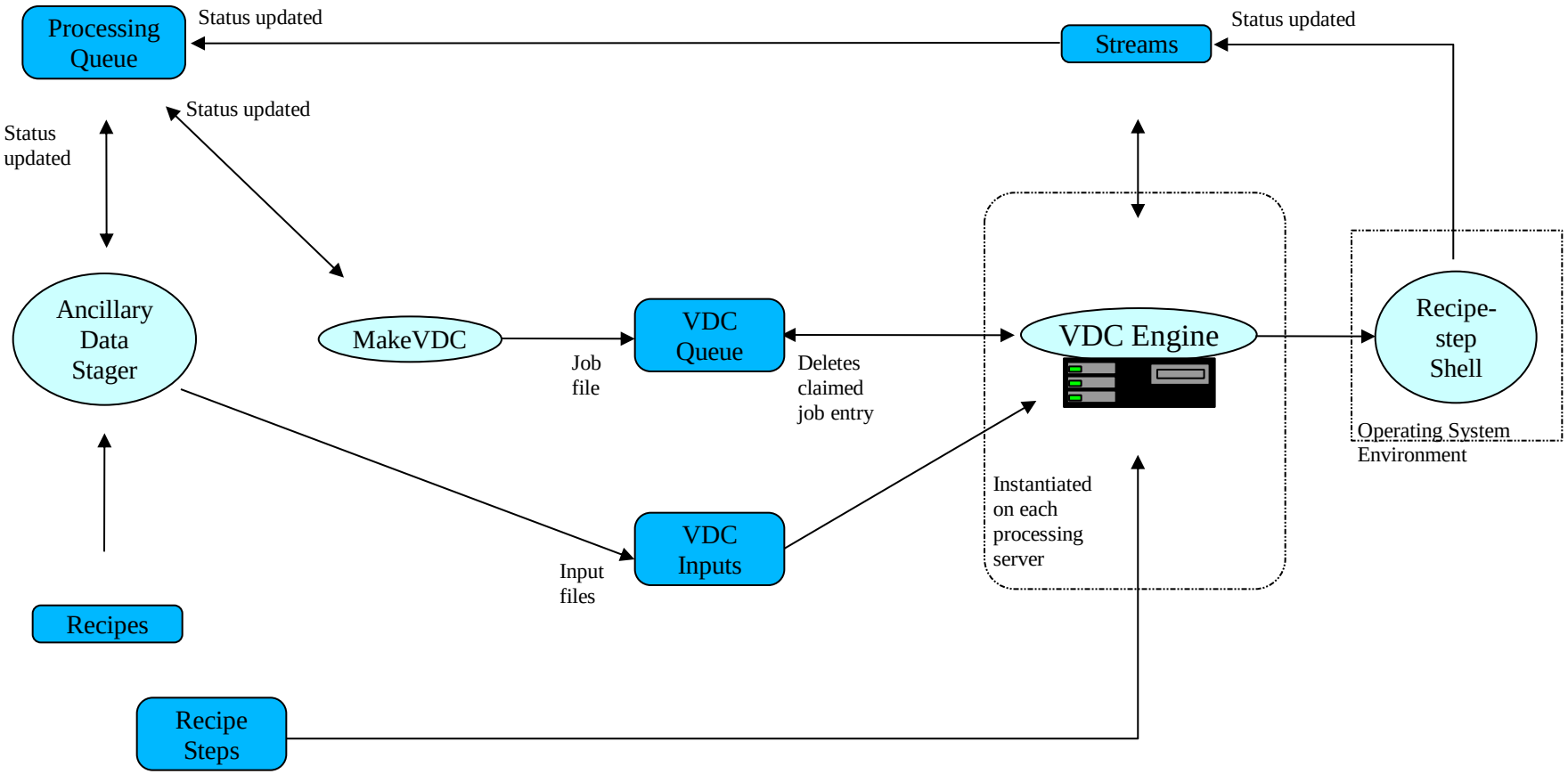
VDC: MakeVDC

- Selects processing-queue entries that have met pre-processing requirements
- Generate VDC job files according to configured priorities
- Runs as a Scheduler task, so it can easily be configured to run as often as needed to keep the VDC queue full

VDC: Engine

- Runs in a daemon-like state on each processing server
- Each instance of the VDC Engine actively competes for jobs that it is allowed to run, based on priority and length of time in the queue
- Monitors and manages processing resources
- Initializes processing streams
- Invokes recipe steps and monitors step-execution time
- Handles operator-requested stream actions

VDC: Diagram


Processing Queue
Status updated
Streams
Status updated
Status updated
Status updated
Ancillary Data Stager
MakeVDC
VDC Queue
Job file
Deletes claimed job entry
VDC Engine
Recipe-step Shell
Operating System Environment
Instantiated on each processing server
VDC Inputs
Input files
Recipes
Recipe Steps

Subsystems: Archive Device Manager (ADM)

- User defines logical pools of storage devices
- Processes request a device in a specific pool
- ADM returns information for a storage device in the requested pool
- If auto cycling is enabled, the ADM time-stamps the record for the selected device, so a different device within the pool will be selected for the next request
- Disk-monitor process polls all devices periodically to record usage statistics and invoke threshold handlers

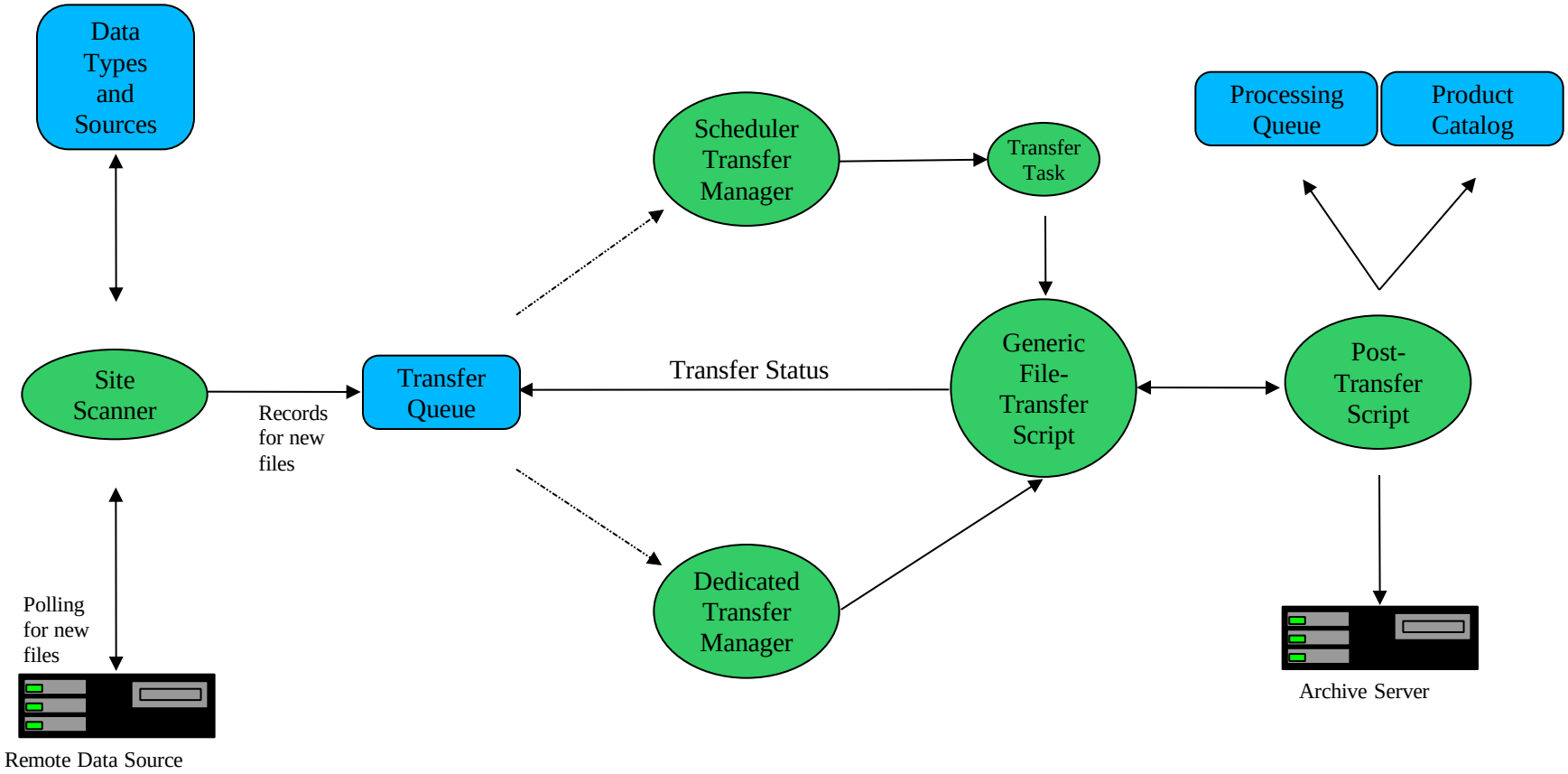
Subsystems: Data Acquisition and Ingest

- Data types and sources are described in the database
- Active, passive, and periodic notification methods
- Active method scans remote systems for new files and populates the ingest queue
- Passive method waits for arrival of E-mail messages describing type and location of new file and populates the ingest queue
- Periodic method schedules transfers of files at user-specified intervals

Subsystems: Data Acquisition and Ingest

- File transfers handled by ingest daemons and Scheduler tasks
- FTP, RCP, and SCP transfer protocols supported
- Generic script handles the file transfer and then hands off to data-specific post-ingest scripts

Subsystems: Data Acquisition and Ingest



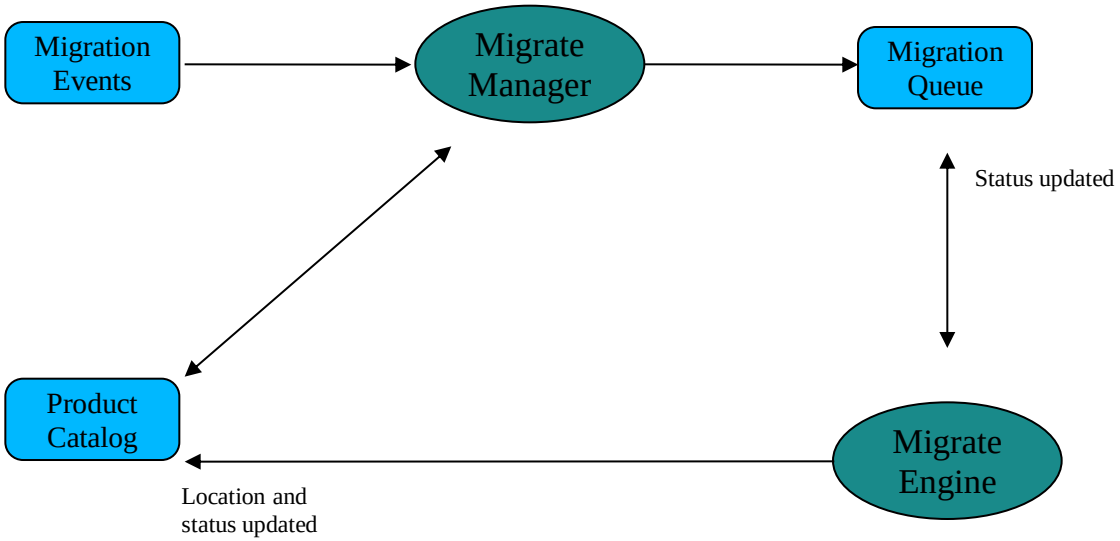
Subsystems: Level-3 Scheduler

- Responsible for scheduling processing for level-3 composite products
- Runs as a Scheduler task
- Configuration is database driven
- Mission-specific stored procedures are invoked to identify input files for a composite product

Subsystems: File Migration and Management

- Responsible for compressing files and migrating them to their various destinations
- Event- or time-based actions
- Queries associated with each action are run periodically by a Scheduler task to select files that are eligible for some type of migratory action and populate a migration queue
- Command-line queuing for file removal and delayed copies
- Migration daemons query the migration queue, perform registered actions on the files, and update catalog tables

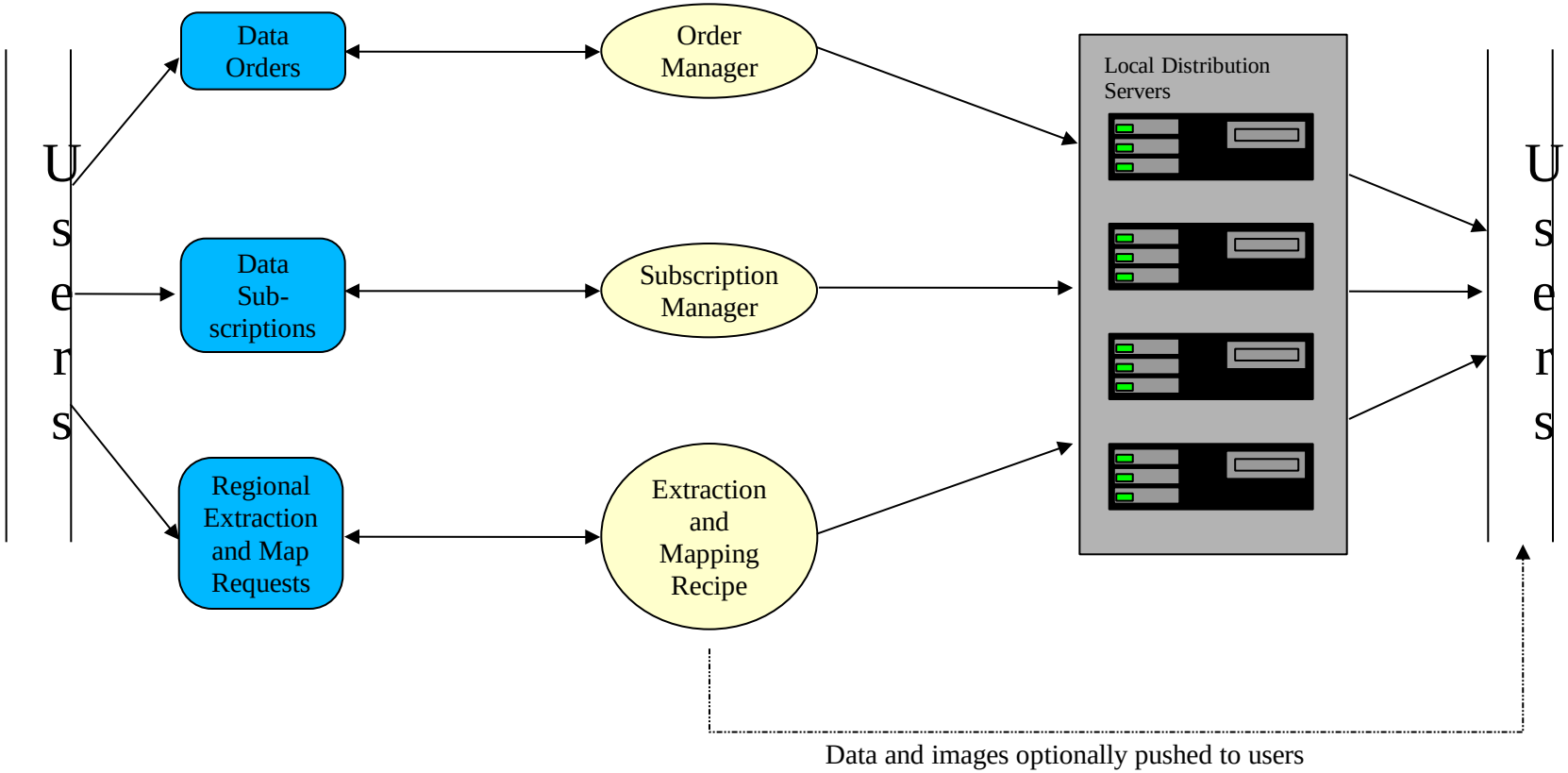
Subsystems: File Migration and Management



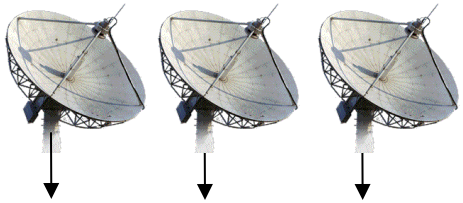
Subsystems: Data Distribution

- Interactive, web-based Data Ordering System, currently supporting SeaWiFS and MODIS Aqua
- Data Subscription System, currently supporting MODIS Aqua, allows users to define region and products of interest
- Order and Subscription Manager Daemons monitor the order and subscription queues and stage files on FTP servers (stage rate ~12 GBs / hr)
- Near-real-time data extraction and image support
- Web-CGI applications that allow users to view and update their orders and subscriptions

Subsystems: Data Distribution



Operational SeaWiFS Data Flow



seawifs2 Wallops

mantaray GSFC/28

Each ground station sends a standard text e-mail notification

Project Mail Server

fetchmail procmail

Incoming Mail Directory

Parses and loads DB records for each down link

Proc SW-GAC Mail

Downlink manager table

Selects best of three down links for ingest

Select downlink

Ingest queue table

Ingest process

SeaWiFS L0 table

MET/Ozone data are dynamically selected for each L1A granule

MET

Ozone

Sensor CAL

Sensor attribs

Atm corr

GPS Elements

L0-L1 (SWl01)

L1A-L2 (MSl12)

L3BIN (l2bin)

L3MAP (smigen)

SeaWiFS L1 table

Archive - Distrib Server

SeaWiFS L2 table

Archive - Distrib Server

SeaWiFS L3-bin table

Archive - Distrib Server

SeaWiFS L3-map table

Archive - Distrib Server

User Community

Ocean Color Web Server

Browser CGI / httpd

MySQL DB

Product meta data are populated from production DB

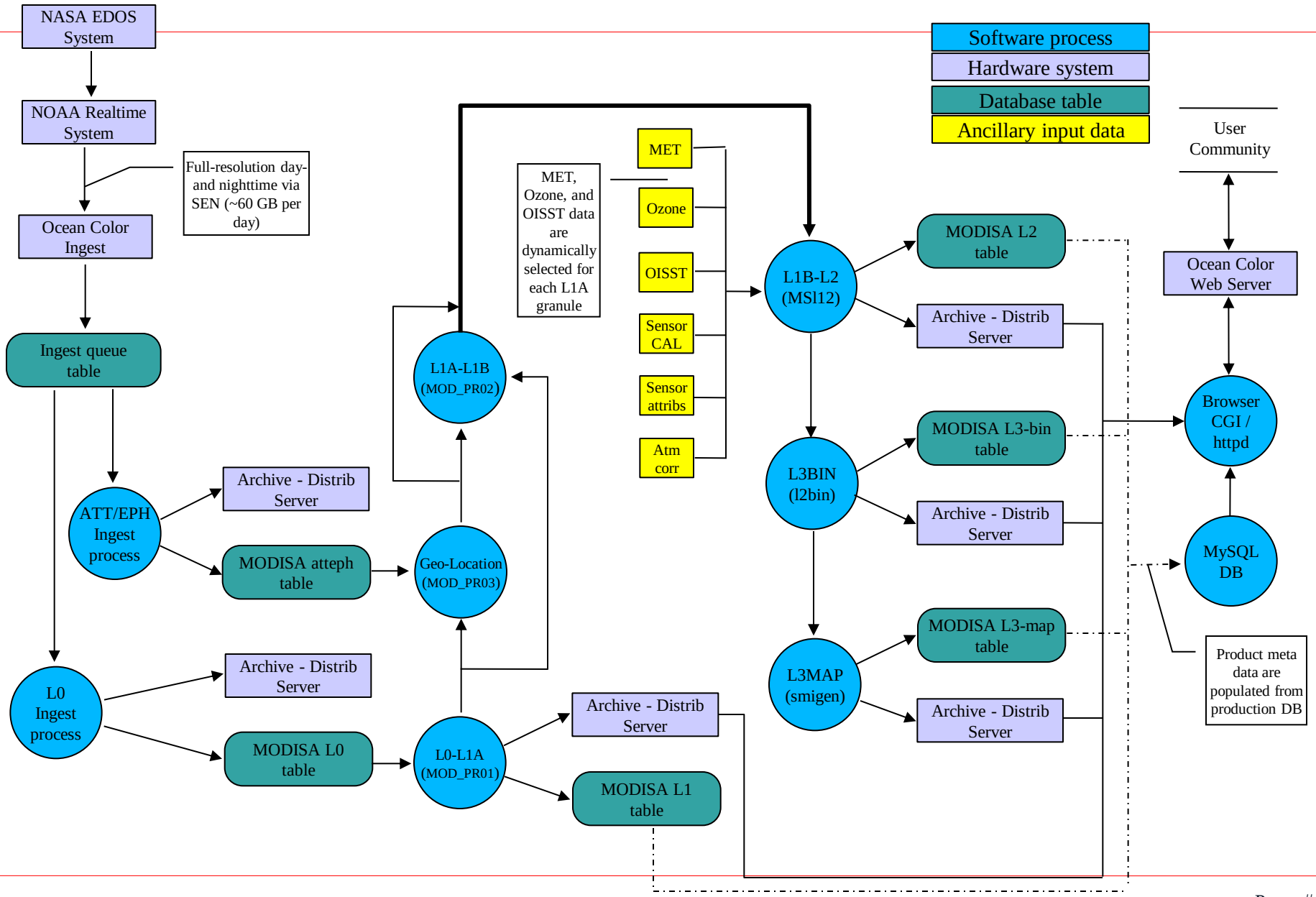
Software process

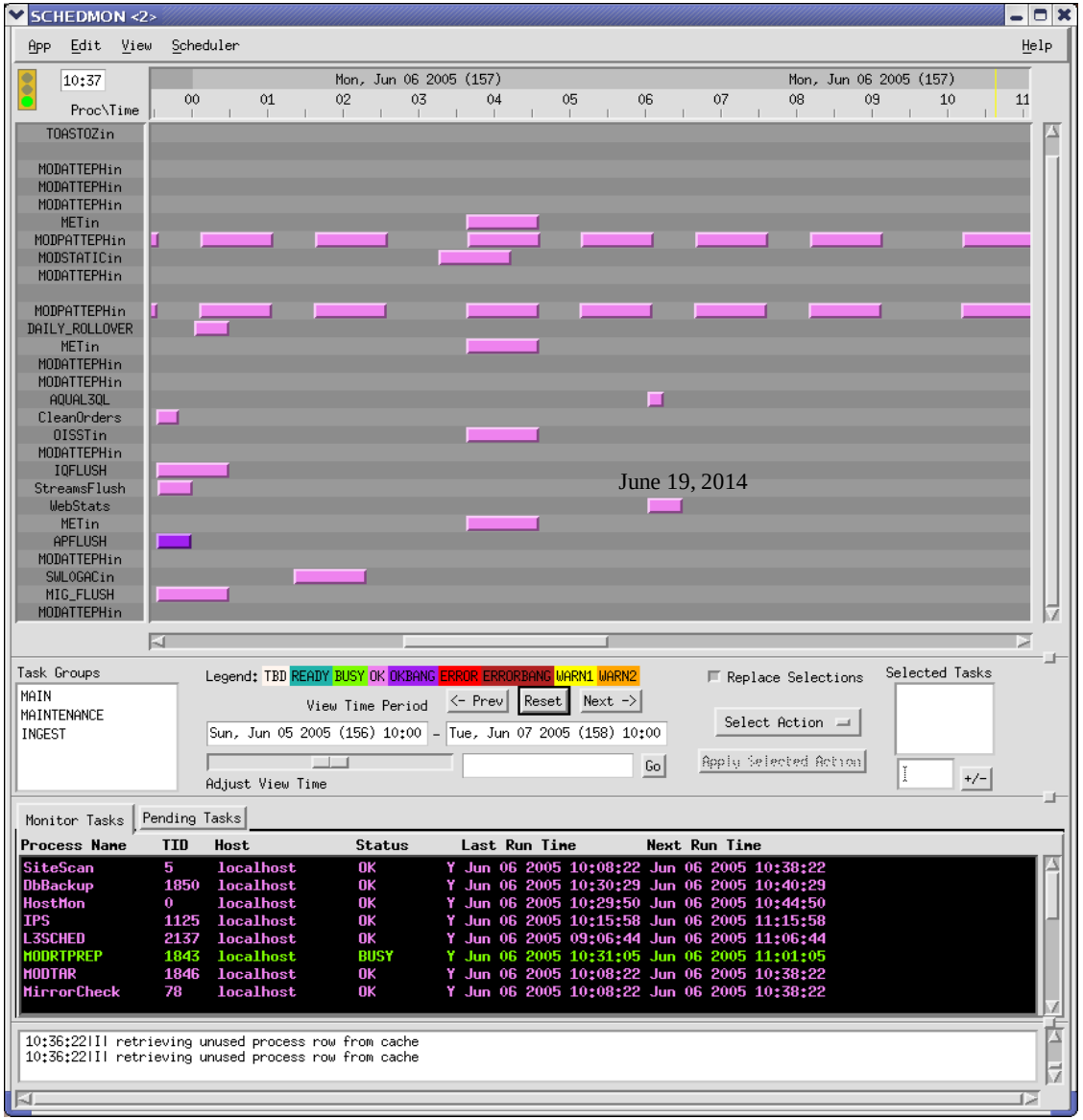
Hardware system

Database table

Ancillary input data

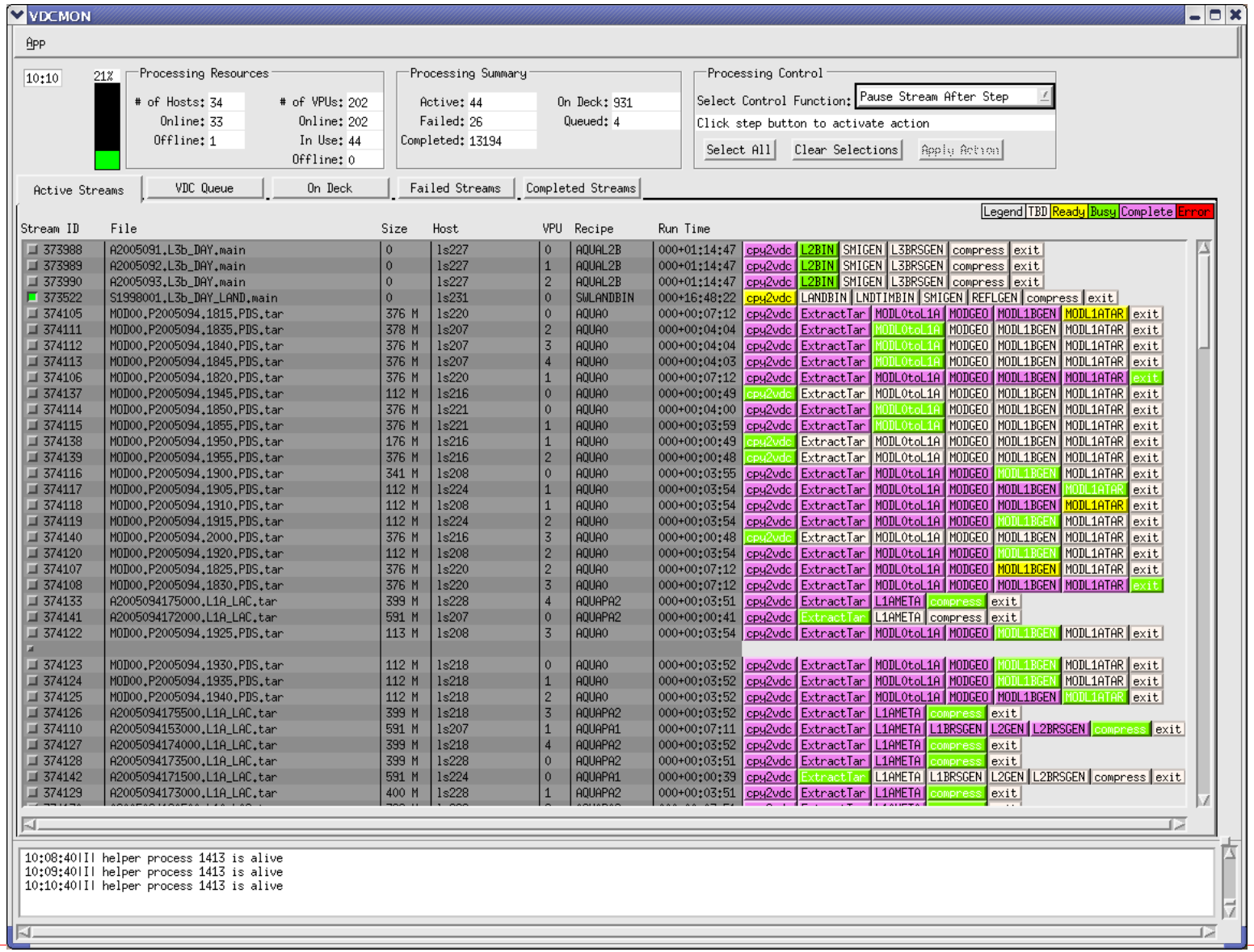
Operational MODIS-Aqua Data Flow (NRTPE)





SCHEDMON

Used to monitor and control the Scheduler activity



VDCMON

Used to monitor and control the VDC activity